ARCHIVED REPORT

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Magic Lantern - Archived 4/2006

Outlook

- According to documentation on the Kaman Aerospace Corporation web site, the Magic Lantern program has come to completion

- No production is forecast

- Barring further activity, this report will be archived in April 2006

10 Year Unit Production Forecast
2005 - 2014

Units

NO PRODUCTION FORECAST

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
	0	0	0	0	0	0	0	0	0	0

Years
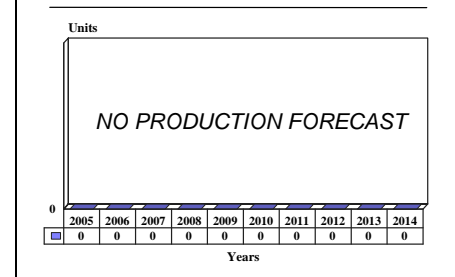
Orientation

Description. Magic Lantern is a mine-detection system manufactured by Kaman Aerospace Corporation that uses an aircraft-mounted laser to detect anchored and floating sea mines.

Sponsor

Kaman Aerospace Corporation
  Old Windsor Road
  PO Box 2
  Bloomfield, CT 06002-0002
  Tel: +1 860 242 4461
  Web site: http://www.kamanaero.com

Status. In service.

Total Produced. An estimated nine Magic Lantern systems have been produced through 2004.

Application. To discover and contain anchored and floating sea mines.

Price Range. The estimated cost of a Magic Lantern system is $6.25 million to $6.5 million in FY01 dollars.

Contractors

Kaman Aerospace Corporation, http://www.kamanaero.com, Old Windsor Rd,PO Box 2, Bloomfield, CT 06002-0002 United States,
    Tel: 1 (860) 242-4461, Fax: 1 (860) 243-7514, Prime

Technical Data

Characteristics. The Magic Lantern mine detection system is designed for helicopter installation. It uses laser light energy to detect objects located in water. The system shoots a blue-green laser pulse into the sea and a camera receives the laser energy reflected by any solid matter.

The Magic Lantern system is comprised of a laser transmitter, scanner, camera, bottom follower, Global

Positioning System (GPS), and processor. The system uses real-time automatic target recognition. A datalink to a ground station allows the targets to be viewed.

Magic Lantern produces imagery with a 2-inch ground resolution over a single laser stroke of 300 feet. Individual images are tiled into a mosaic displaying large sections of the reconnaissance pass. Underwater

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resolution is limited by water column blurring and sea-surface wave distortion.

The mine detection system operates at altitudes between 400 and 1,500 feet above sea level. Higher altitudes provide a superior field of view. Lower altitudes offer a better signal-to-noise ratio and improved resolution.

Variants/Upgrades

Kaman has been developing a commercial version of Magic Lantern, known tentatively as Fish Eye, that is designed to locate schools of fish for commercial fishermen. This civil variant is less sensitive than the military version.

Program Review

Background. Magic Lantern began as a private venture initiated by the Kaman Aerospace Corporation in September 1987. Soon thereafter, Kaman received partial funding for the mine detection system from the U.S. Navy.

In FY90, Congress awarded Kaman money to start a two-year developmental effort for the Magic Lantern system. In May 1990, the Navy successfully tested a demonstration version at the Naval Surface Warfare Center in Panama City, Florida.

To study the problems facing laser mine detection systems, the U.S. Navy sponsored the Magic Lantern Adaptation (MLA) program. The MLA project was to collect and analyze coastal water data. Analysis of the information revealed a dilemma for automatic target recognition algorithms; specifically, the algorithms had a hard time distinguishing land clutter from underwater mine targets.

Using MLA data and a new algorithm, the ability to vary target feature thresholds to reduce false alarm rates was successfully demonstrated. Results showed a target probability of detection and classification of 50 percent to 78 percent, with false alarms per frame equaling less than 4 percent.

In September 2000, the U.S. Congress reprogrammed funds to install the three existing Magic Lantern systems onto MH-53E helicopters. For the MH-53Es to accept the Magic Lantern, Kaman Aerospace must furnish the copters with special kits.

In April 2002, Kaman Aerospace successfully completed integrating and demonstrating its Magic Lantern system on an MH-53E helicopter. During the demonstration, the Magic Lantern lidar sensor system showed a 100 percent success rate detecting the designated targets. Localization accuracy was within the specifications for the sensor system and there were no false alarms. Moreover, target detections occurred both while the aircraft was hovering and in forward flight. Kaman conducted the integration and demonstration under a Naval Air Systems Command contract awarded to Kaman Aerospace's Electro-Optic Development Center in October 2000.

Recent Developments. By year-end 2002, Kaman Aerospace completed installing the three existing Magic Lantern systems onto MH-53E helicopters as directed by the U.S. Congress in September 2000.

Funding

Money received by Kaman Aerospace from the sale of the Magic Lantern system funds further production of the system.

Recent Contracts

No recent contracts have been identified.

Timetable

Month	Year	Major Development
Sep	1987	Magic Lantern development initiated by Kaman Aerospace
May	1990	Demonstrator tested by Navy in Panama City, Florida

Month	Year	Major Development
Nov	1991	Kaman awarded procurement contract for two advanced development models
	1993	Fabrication of the advanced development model complete
	1994	RFPs for two engineering and manufacturing development models released
June	1996	Contract from U.S. Navy for a third Magic Lantern system
	1997	Construction of engineering and manufacturing development model complete
Sep	2000	The U.S. Congress reprogrammed funds to install the three existing Magic Lantern systems onto MH-53E helicopters
Jan	2001	Kaman Aerospace indicates that the three existing Magic Lantern systems are in the process of being fixed onto MH-53E helicopters
Apr	2002	Kaman Aerospace successfully completes integrating and demonstrating its Magic Lantern system on an MH-53E helicopter
	2002	Kaman Aerospace completes installing the three existing Magic Lantern systems onto MH-53E helicopters

Worldwide Distribution

The Magic Lantern system is used by the **United States Navy**. Kaman Aerospace Corporation is marketing the system to Japan, South Korea, Taiwan, and Thailand. Kuwait and Saudi Arabia have expressed interest in the Magic Lantern system as well.

Forecast Rationale

Designed and manufactured by Kaman Aerospace Corporation, Magic Lantern is an airborne mine detection system. To find anchored and floating sea mines, the Magic Lantern system uses light detection and ranging (lidar) technology. Kaman Aerospace designed the Magic Lantern system for helicopter installation.

According to documentation on the Kaman Aerospace Corporation web site, the Magic Lantern program has come to completion. Consequently, no production of the Magic Lantern System is foreseen at this time. Unless developments with the Magic Lantern system occur, Forecast International will archive this report in April 2006.

Ten-Year Outlook

No further production is forecast. This report will be archived in April 2006. Should activity on this system resume, this report will be updated and reissued as appropriate.

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